

Advisory Action Attachment

withdrawn rejections

In view of the after final amendment filed 9-10-08, the following rejections have been withdrawn: (1) the 35 USC 112 first and second paragraph rejections, (2) the 102 rejection, and (3) the 103 rejection set forth in paragraph 8 of the final office action dated 7-9-08.

However, the 103 rejection set forth in paragraph 9 of the final office action dated 7-9-08 stands.

remarks

Applicant states: "In the instant application, increasing vortexes, as defined in Claim 1," (page 5 of after final filed 9-10-08, emphasis added). Applicant is incorrect. Claim 1 fails to define or require "increasing vortexes". Claim 1 recites "wherein water can flow in the circumferential grooves along the line portions to form a vortex flow [singular]" instead of --increasing vortexes--. Only one vortex flow is mentioned in claim 1. The vortex flow described in claim 1 is schematically illustrated in applicant's Figure 7. Claim 1 is silent as to the presence or absence of eddies *within the boundary layer* of water contacting a groove surface.

Applicant argues "... it is improper for the Examiner to modify the Heinen reference in a manner that increases the creation of vortexes ... " (page 5 of after final filed 9-10-08, emphasis in original). This argument is irrelevant because no such modification of Heinen is being made.

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Applicant argues: "... the Heinen reference teaches away from any modifications that would increase vortexes" (page 5 of response filed 9-10-08, emphasis in original). This argument is not persuasive. First: Claim 1 describes "wherein water can flow in the circumferential grooves along the line portions to form a vortex flow" and fails to require increasing vortexes. Heinen's peaks and valleys, when inclined as disclosed (e.g. at 45 degrees) are capable of forming "a vortex flow" in the water. Heinen's disclosed tread structure satisfies the claimed requirement of the capability "to form a vortex flow". It is emphasized that (1) the structure disclosed in the specification and used by applicant to create "a vortex flow" comprises ridges or recesses that are inclined in one direction with respect to the circumferential direction (i.e. at an angle of 10-60 degrees as described in paragraphs 6 and 18 of the original disclosure) and (2) Heinen's peaks and valleys, when inclined as disclosed (e.g. at 45 degrees as disclosed at col. 3 lines 19-21) are ridges or recesses that are inclined in one direction with respect to the circumferential direction. The same structure of ridges or recesses that are inclined in one direction with respect to the circumferential direction is used by both applicant and Heinen. Second: Claim 1 and the original disclosure fail to require increasing vortexes. The description of "increasing vortexes" is found in the remarks of the after final amendment filed 9-10-08, but not the original disclosure. Instead of teaching increasing eddies within the boundary layer of water of water contacting a groove wall surface, the original disclosure teaches "... the contact resistance between water and the wall face of the groove is significantly reduced ..." (paragraph 7). Heinen also teaches reducing contact resistance between water and the wall face of the groove

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because Heinen teaches "... the skin friction drag along the respective surface of the groove will be reduced and the flow of water from the groove should be increased" (col. 3 lines 34-36).

Applicant argues that one of ordinary skill in the art would not modify the tire of Heinen reference so that it includes circumferential grooves with line portions therein such that "water can flow in the circumferential grooves along the line portions to form a vortex flow" (page 6 of after final filed 9-10-08). This argument is not persuasive because no such modification of the Heinen reference is necessary. As already explained above, **Heinen's peaks and valleys, when inclined as disclosed (e.g. at 45 degrees) are capable of forming "a vortex flow" in the water.** It is again emphasized that (1) the structure disclosed in the specification and used by applicant to create "a vortex flow" comprises ridges or recesses that are inclined in one direction with respect to the circumferential direction (i.e. at an angle of 10-60 degrees as described in paragraphs 6 and 18 of the original disclosure) and (2) Heinen's peaks and valleys, when inclined as disclosed (e.g. at 45 degrees as disclosed at col. 3 lines 19-21) are ridges or recesses that are inclined in one direction with respect to the circumferential direction. **The same structure of ridges or recesses that are inclined in one direction with respect to the circumferential direction is used by both applicant and Heinen.**

Applicant argues that one of ordinary skill in the art would not have chosen the incline angle to be 10 and 35 degrees in a configuration that would increase vortex creation, because doing so would change the principle of operation of the tire of the

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Heinen reference. Applicant asserts that the principal of Heinen is to minimize turbulence by eliminating all vortexes/eddies. This argument is not persuasive. First: Contrary to applicant's argument, the principle of operation of the tire of Heinen is not being changed. Heinen teaches forming peaks and valleys in a groove to disrupt eddies along the side surfaces of the groove to decrease friction drag. The formation of a vortex flow in a circumferential groove assists this principal of operation of Heinen since the optional Japan 509 teaches that a vortex flow accompanies holding down of generation of random eddies. Second: Heinen's teachings are directed toward vortexlike motion with the boundary layer running contrary to the main current. The claimed vortex flow reads on a vortex flow running with the main current instead of contrary to the main current. Heinen contains no teaching to reduce a vortex flow running with the main current. Third: There is no evidence of record showing that the selection of 10-35 degrees increases vortex creation. Instead of teaching that the range of 10-35 degrees is critical to increasing vortex creation, the original disclosure teaches using an angle of 10-60 degrees and comments "When this inclined angle α is out of this range, the effect of creating a vortex flow is insufficient." (paragraph 18). Moreover, the *lowest* index (105) for hydroplaning preventing capability disclosed by applicant was obtained using an angle (10 degrees) within the claimed range of 10-35 degrees. See Table 1 of the original disclosure.

With respect to the range of 10-35 degrees, examiner maintains that it would have been obvious to one of ordinary skill in the art to orient the peaks and valleys ("line portions") in Heinen's circumferential groove such that the peaks and valleys are

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inclined at an angle "from 10° to 35° with respect to the tire circumferential direction" such as 35 degrees since (1) Heinen, directed to a pneumatic tire having grooves with peaks and valleys, suggests inclining the valleys at a preferred angle of 45-90 degrees with respect to the median plane of the groove extending in the longitudinal direction to reduce skin friction drag along the groove surface and increase the flow of water from the groove and (2) Shesterkin, directed to a pneumatic tire having grooves with peaks and valleys, teaches forming ridges ("peaks") at the bottom of circumferential grooves such that they are inclined at an angle of at least 20 degrees (e.g. an angle of the order of 45 degrees) with respect to the longitudinal direction of the grooves to deviate the course of cracks or reduce the number of cracks. The Federal Circuit has stated: "... our case law does not require that a particular combination must be the preferred, or most desirable, combination described in the prior art in order to provide motivation for the current invention." In re Fulton 73 USPQ2D 1141, 1146 (Fed. Cir. 2004). Heinen does not teach that angles less than 45 degrees are undesirable and, therefore, does not teach away. When the applied prior art to Heinen and Shesterkin is considered as a whole, one of ordinary skill in the art would have readily appreciated that the angle of Heinen's valleys may be inclined at an angle less than 45 degrees such as 35 degrees. The expected benefits of inclining Heinen's valleys at an angle of less than 45 degrees such as 35 degrees include increased flow of water from the groove (Heinen) and reduced cracking (Shesterkin).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Steven D. Maki/
Primary Examiner, Art Unit 1791

Steven D. Maki
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